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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,441	10/14/2005	Hans-Georg Gobbel	279531US0PCT	1431

22850 7590 08/07/2007

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EXAMINER	
GALLIS, DAVID E	

ART UNIT	PAPER NUMBER
1625	

NOTIFICATION DATE	DELIVERY MODE
08/07/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/553,441	GOBBEL ET AL.	
	Examiner	Art Unit	
	David E. Gallis	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 11 through 28 are pending. Claims 1 through 10 have been cancelled. Applicant's claim of priority to Germany 103 17 519.9 filed March 4 2003 is acknowledged.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 11 through 17, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rueter (US 6,024,840, February 15, 2000), and further in view of Cornell (US 2,509,136, May 23, 1950), as applied to claims 11 through 17, 19, and 20 above.

3. Claim 11 is drawn to a process of preparing propylene oxide comprising (iii) the distillation of propylene oxide from a mixture containing at least one solvent, with the vapor stream consisting of propylene oxide, and (iv) compressing the vapor stream by means of at least one compressor. Claim 12 recites a limitation of claim 11 requiring methanol as the solvent, and claim 13 recites a further limitation on claim 11 requiring the distillation be performed in a pressure range from 450 to 750 mbar (0.45 to 0.75 bar). Claim 14 recites the limitation of claim 11 that the compression of the vapor stream be carried out using a turbocompressor. Claim 15 recites the limitation of claim 11 that the vapor is compressed to a pressure ranging from 2 to 5 bar and the

compressed vapor has a temperature in the range of 8 to 20°C above the medium vaporizing in distillation column. Claim 16 recites the limitation of claim 11 that the compressed vapor is condensed and at least part of the heat of condensation be returned to to at least one vaporizer used in the distillation column. Claim 17 recites the limitation of claim 11 that at least part of the compressed vapor stream condensate be cooled to 10 to 30°C in at least one heat exchanger and returned as reflux to the distillation column. Claim 19 recites the limitation of claim 11 wherein the energy stored in the bottom stream is at least partly used to heat the propylene oxide/ solvent mixture prior to it fractional distillation. Claim 20 recites the limitations of claim 11 wherein (i) propene is reacted with hydrogen peroxide in the presence of a titanium silicalite catalyst in methanol giving a mixture comprising propylene oxide, unreacted propene and methanol, and (ii) separating of unreacted propene to give a mixture comprising propylene oxide and methanol..

4. Rueter teaches a mixture formed by epoxidizing propylene with hydrogen peroxide using titanium silicalite as a catalyst and methanol as a reaction solvent (see column 1, lines 7 through 11), and using distillation as a separation process of the crude reaction mixture (see column 2, (a) and (b)). The mixture comprises propylene oxide, methanol, and propylene (see column 2 Table, lines 55 through 61). The distillation procedure taught by Rueter comprises withdrawing an overhead stream (vapor stream) comprising propylene oxide, and withdrawing a bottom stream comprising methanol (see column 2, (c) and (d). Rueter also teaches removal of unreacted propylene (propene) by prior distillation (see column 2 lines 45 through 48). Rueter does not

however teach compressing the vapor stream (top product) with the use of a compressor and returning the heat of condensation of the condensate to the distillation system.

5. Cornell teaches the use of a compressor to compress the overhead fraction vapors in the distillation of volatile oxygenated organic compounds (i.e. propylene oxide) from water, and passing the compressed vapor into indirect heat exchange with a reboiler in a fractionation zone and returning part of the condensate as reflux to the distillation column (see page 1, column 2, lines 17 through 24; Items 18, 23, 24 and 27 of drawing; column 9, lines 11 through 20; column 4, ¶2). Cornell further teaches the use of the heat stored in the bottom product to be heat exchanged with the mixture fed into the distillation column (see column 3, lines 49 through 56; Items 6, 9, and 12 of drawing). Although not specific to propylene oxide separation, Cornell clearly teaches the use of a compressor for vapor fraction compression and heat exchange to a vaporizer (reboiler) in the distillation system.

6. Clearly, Rueter combined with Cornell teach all the functional elements of the instant claims 11 through 12, 16, 17, 19, and 20. It would be obvious to one ordinarily skilled in the art that compression of the vapor stream is not unique to propylene oxide distillation, and that Cornell's apparatus is adaptable, and with predictable results, to any distillation by the selection of temperature and pressure parameters dictated by the properties of the distillate. Claim 15 recites a pressure and temperature range dictated by physical properties of distillates (i.e. pv=nRt). Varying these parameters is obvious to, and standardly employed by, one of ordinary skill in the art. This has been

recognized as such by case law with In re Aller, Lacey, and Hall, 105 USPQ 233 where the opinion cited "Any chemist reading the article could logically assume that higher yields might be obtainable, and by experimentally varying the conditions ... could find the most productive conditions." Claim 14 specifies that the compression of the vapor stream be carried out using a turbocompressor. This limitation is obvious design selection with respect to distillation system as a myriad of compressors are known for the same purpose (i.e. rotary piston compressors, screw compressors, diaphragm-type compressors, etc.,) and their interchangeability is obvious to one skilled in the art. Claim 13 specifies a limitation that the distillation be operated at a pressure of 0.450 to 0.75 bar. This limitation is likewise obvious design selection since reduced pressure distillation is a very well known procedure (also conforming to pv=nRt), and the instant disclosure teaches that the distillation can be carried out under all suitable conditions (i.e. all suitable pressures).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 21 through 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rueter (US 6,024,840, February 15, 2000), and further in view of Cornell (US 2,509,136, May 23, 1950), as applied to claims 21 through 26.

9. Claim 21 is drawn to a process of preparing propylene oxide comprising (iii) the distillation of propylene oxide from a mixture containing at least methanol, with the vapor stream consisting of propylene oxide, and (iv) compressing the vapor stream by means of at least one compressor. Claim 22 recites a further limitation on claim 21 requiring the distillation be performed in a pressure range from 450 to 750 mbar (0.45 to 0.75 bar). Claim 23 recites the limitation of claim 21 that the compression of the vapor stream be carried out using a turbocompressor. Claim 24 recites the limitation of claim 21 that the vapor is compressed to a pressure ranging from 2 to 5 bar and the compressed vapor has a temperature in the range of 8 to 20°C above the medium vaporizing in distillation column. Claim 25 recites the limitation of claim 21 that the compressed vapor is condensed and at least part of the heat of condensation be returned to at least one vaporizer used in the distillation column. Claim 26 recites the limitation of claim 21 that at least part of the compressed vapor stream condensate be cooled to 10 to 30°C in at least one heat exchanger and returned as reflux to the distillation column.

10. Rueter teaches a mixture formed by epoxidizing propylene with hydrogen peroxide using titanium silicalite as a catalyst and methanol as a reaction solvent (see column 1, lines 7 through 11), and using distillation as a separation process of the crude reaction mixture (see column 2, (a) and (b)). The mixture comprises propylene oxide, methanol, and propylene (see column 2 Table, lines 55 through 61). The distillation procedure taught by Rueter comprises withdrawing an overhead stream (vapor stream) comprising propylene oxide, and withdrawing a bottom stream comprising methanol

(see column 2, (c) and (d). Rueter also teaches removal of unreacted propylene (propene) by prior distillation (see column 2 lines 45 through 48). Rueter does not however teach compressing the vapor stream (top product) with the use of a compressor and returning the heat of condensation of the condensate to the distillation system.

11. Cornell teaches the use of a compressor to compress the overhead fraction vapors in the distillation of volatile oxygenated organic compounds (i.e. propylene oxide) from water, and passing the compressed vapor into indirect heat exchange with a reboiler in a fractionation zone and returning part of the condensate as reflux to the distillation column (see page 1, column 2, lines 17 through 24; Items 18, 23, 24 and 27 of drawing; column 9, lines 11 through 20; column 4, ¶2). Although not specific to propylene oxide separation, Cornell clearly teaches the use of a compressor for vapor fraction compression and heat exchange.

12. Clearly, Rueter combined with Cornell include all the functional elements of the instant claims 21, 22, 25 and 26. It would be obvious to one ordinarily skilled in the art that compression of the vapor stream is not unique to propylene oxide separation, and that Cornell's apparatus is adaptable, and with predictable results, to any vapor stream in a distillation by the selection of temperature and pressure parameters dictated by the properties of the distillate. Claim 24 recites a pressure and temperature range dictated by physical properties of distillates (i.e. pv=nRt). Varying these parameters is obvious to, and standardly employed by, one of ordinary skill in the art. This has been recognized as such by case law with In re Aller, Lacey, and Hall, 105 USPQ 233 where

the opinion cited "Any chemist reading the article could logically assume that higher yields might be obtainable, and by experimentally varying the conditions ... could find the most productive conditions." Claim 23 specifies that the compression of the vapor stream be carried out using a turbocompressor. This limitation is obvious design selection with respect to distillation system as a myriad of compressors are known for the same purpose (i.e. rotary piston compressors, screw compressors, diaphragm-type compressors, etc.,) and their interchangeability is obvious to one skilled in the art.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rueter (US 6,024,840, February 15, 2000), and further in view of Cornell (US 2,509,136, May 23, 1950), as applied to claim 28.

15. Claim 28 is drawn to a process of preparing propylene oxide comprising (iii) the distillation of propylene oxide from a mixture containing at least one solvent, with the vapor stream consisting of propylene oxide, and (iv) compressing the vapor stream by means of at least one compressor. Claim 28 also requires that (i) propene is reacted with hydrogen peroxide in the presence of a titanium silicalite catalyst in methanol giving a mixture comprising propylene oxide, unreacted propene and methanol, and (ii) separating of unreacted propene to give a mixture comprising propylene oxide and

methanol. Claim 28 further requires that the compressed vapor is condensed and at least part of the heat of condensation be returned to to at least one vaporizer used in the distillation column, and that at least part of the compressed vapor stream condensate be cooled to 10 to 30°C in at least one heat exchanger and returned as reflux to the distillation column.

16. Rueter describes a mixture formed by epoxidizing propylene with hydrogen peroxide using titanium silicalite as a catalyst and methanol as a reaction solvent (see column 1, lines 7 through 11), and using distillation as a separation process of the crude reaction mixture (see column 2, (a) and (b)). The mixture comprises propylene oxide, methanol, and propylene (see column 2 Table, lines 55 through 61). The distillation procedure taught by Rueter comprises withdrawing an overhead stream (vapor stream) comprising propylene oxide, and withdrawing a bottom stream comprising methanol (see column 2, (c) and (d). Rueter also teaches removal of unreacted propylene (propene) by prior distillation (see column 2 lines 45 through 48). Rueter does not however teach compressing the vapor stream (top product) with the use of a compressor and returning the heat of condensation of the condensate to the distillation system.

17. Cornell teaches the use of a compressor to compress the overhead fraction vapors in the distillation of volatile oxygenated organic compounds (i.e. propylene oxide) from water, and passing the compressed vapor into indirect heat exchange with a reboiler in a fractionation zone and returning part of the condensate as reflux to the distillation column (see page 1, column 2, lines 17 through 24; Items 18, 23, 24 and 27

of drawing; column 9, lines 11 through 20; column 4, ¶2). Cornell further teaches the use of the heat stored in the bottom product to be heat exchanged with the mixture fed into the distillation column (see column 3, lines 49 through 56; Items 6, 9, and 12 of drawing). Although not specific to propylene oxide separation, Cornell clearly teaches the use of a compressor for vapor fraction compression and heat exchange to a vaporizer (reboiler) in the distillation system.

18. Clearly, Rueter combined with Cornell include all the functional elements of the instant claim 28. It would be obvious to one ordinarily skilled in the art that compression of the vapor stream is not unique to propylene oxide distillation, and that Cornell's apparatus is adaptable, and with predictable results, to any vapor stream in a distillation by the selection of temperature and pressure parameters dictated by the properties of the distillate.

Claim Rejections - 35 USC § 112

19. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

20. Claims 18 and 27 recites the limitation "propene is compressed in the at least one of the heat exchanger used in (vi) is vaporized completely with depressurization". There is insufficient antecedent basis for this limitation in the claim. Claim 18 indirectly depends from claim 11 and 27 indirectly depends from claim 21, in which none of the independent claims or intervening claims address propene as a distillate in any way.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Gallis whose telephone number is 571-272-9068. The examiner can normally be reached on Mon-Fri 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-1600. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David E. Gallis
Patent Examiner

BERNARD DENTZ
PRIMARY EXAMINER